ATTACHMENT - CLAIMS LISTING

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A method of manufacturing an electrical component, comprising the steps of:

bonding a thin metal foil to an insulating substrate and thereby forming a component blank having a metal face that comprises a surface of said metal foil;

laser machining at least the metal foil of said component blank to produce at least one trench for defining one or more foil tracks, without fully penetrating the insulating substrate, said trench being at least equal in depth to the thickness of the foil so as to prevent current flow across the trench; and

filling said trench with a trench filling material without overlaying said metal face with said trench filling material.

2. (Original) A method as claimed in claim 1, including performing said laser machining by means of a laser with a cutting width, and creating foil tracks with a spacing approximately equal to said cutting width.

3. (Original) A method as claimed in claim 1, wherein said cutting width is from 25 to 30 μm.

4. (Original) A method as claimed in claim 1, wherein said trench filling material is an insulating material.

5. (Original) A method as claimed in claim 3, wherein said insulating material is a polymer.

6. (Original) A method as claimed in claim 5, wherein said polymer comprises an epoxy resin.

7. (Original) A method as claimed in claim 1, wherein said trench filling material is a dielectric material and said electric component is a sensor that responds to changes in said dielectric material.

8. (Original) A method as claimed in claim 1, wherein said electrical component is a foil sensor, and said method further comprises forming said metal foil from a parent foil that is substantially identical with the material of the structure to be monitored.

9. (Original) A method as claimed in claim 1, further comprising laser machining said component blank to produce one or more back slots, said back slots being equal in depth to the full thickness of said component blank.

10. (Original) A method as claimed in claim 9, wherein laser machining said component blank comprises producing slots of approximately 150 μm length at 1.5 mm intervals.

11. (Original) A method as claimed in claim 9, further comprising introducing a trench filling material into said trenches via said back slots.

12. (Original) A method as claimed in claim 1, further comprising preparing the metal foil by machining a sample of parent material to a desired final thickness.

13. (Original) A method as claimed in claim 12, comprising alternately machining both faces of the parent material until said final thickness is achieved.

14. (Original) A method as claimed in claim 1, further comprising preparing the metal foil for said bonding by applying a chemically resistant film to a first face of said foil, and applying a bond enhancer to the other face of said foil, wherein said first face is ultimately the exposed face and said chemically resistant film protects said first face from said bond enhancer.

15. (Original) A method as claimed in claim 14, comprising drying said foil and then removing said film.

16. (Original) A method as claimed in claim 14, wherein said chemically resistant film comprises a polyester tape.

17. (Original) A method as claimed in claim 1, wherein said insulating material is chosen to have an ablation rate that is sufficiently low to prevent unwanted penetration of the substrate during machining to remove said foil.

18. (Original) A method as claimed in claim 17, wherein said insulating substrate comprises a plurality of layers of fibreglass prepreg.

19. (Previously Presented) A method as claimed in claim 1, wherein said electrical component is a foil sensor and the method further comprises preparing said component blank by coating said component blank on the surface comprising the ultimate sensor side of said sensor blank with a chemically resistant coating solution, to protect said surface from contamination during sensor processing.

20. (Original) A method as claimed in claim 19, comprising drying said sensor blank after coating said sensor blank.

21. (Original) A method as claimed in claim 1, comprising laser machining said blank to form two different types of sensors.

22. (Original) A method as claimed in claim 1, wherein said electrical component is selected from the group of:

a linear polarisation resistance gauge;

a corrosion sensor;

a resistance sensor;

a non-destructive testing sensor;

a spiral inductor;

a delay line;

a capacitor; and

a sensor responsive to changes in a dielectric material.

23. (Original) A method as claimed in claim 1, including producing said trench with a ratio of depth to width of from 1:1 to 7:1.

24. (Original) A method as claimed in claim 1, including forming said trench with side walls that are substantially straight.

25. (Previously Presented) An electrical component produced according to the method of claim 1.

26. (Previously Presented) A foil sensor produced according to the method of claim 1.

27. (Currently Amended) An electrical component, comprising:

an insulating substrate;

a thin metal foil bonded to said insulating substrate;

a metal face comprising a surface of said thin metal foil; and

at least one laser machined trench for defining one or more foil tracks so as to prevent current flow across the trench, said trench being at least equal in depth to the thickness of the foil without fully penetrating the insulating substrate;

wherein said trench is filled with a trench filling material applied without overlaying said metal face.

28. (Original) An electrical component as claimed in claim 27, wherein said trench is laser machined by means of a laser with a cutting width, and said foil tracks have a spacing approximately equal to said cutting width.

29. (Original) An electrical component as claimed in claim 27, wherein said cutting width is from 25 to 30 μm.

30. (Previously Presented) An electrical component as claimed in claim 27, wherein said trench filling material is an insulating material.

31. (Original) An electrical component as claimed in claim 30, wherein said insulating material is a polymer.

32. (Original) An electrical component as claimed in claim 31, wherein said polymer comprises an epoxy resin.

33. (Original) An electrical component as claimed in claim 27 wherein said trench filling material is a dielectric material.

34. (Original) An electrical component as claimed in claim 27, wherein said electrical component comprises at least one of:

a linear polarisation resistance gauge;
a corrosion sensor;
a resistance sensor;
a non-destructive testing sensor;
a spiral inductor;
a delay line;
a capacitor; and
a sensor responsive to changes in a dielectric material.

35. (Original) An electrical component as claimed in claim 27, wherein said electrical component comprises two or more different types of foil sensors.

36. (Original) An electrical component as claimed in claim 27, wherein the metal foil has a thickness in the range of 15 to 200 μm.

37. (Previously Presented) An electrical component as claimed in claim 27, wherein said trench has a ratio of depth to width of from 1:1 to 7:1.

38. (Original) An electrical component as claimed in claim 27, wherein said trench has side walls that are substantially straight.

39. (Original) An electrical component as claimed in claim 27, wherein said substrate is formed of a material having a sufficiently low rate of ablation to prevent unwanted penetration of the substrate during machining.

40. (Original) An electrical component as claimed in claim 39, wherein said substrate comprises a plurality of layers of fibreglass prepreg.

41. (Previously Presented) An electrical component as claimed in claim 27, wherein said electrical component is a foil sensor and said metal foil is from a parent foil that is substantially identical with the material of the structure to be monitored.

42. (Currently Amended) An electrical component as claimed in claim 27, comprising one or more back slots formed by laser machining said component blank ~~formed by laser machining said component blank~~, said slots being equal in depth to the combined thickness of said foil and said substrate.

43. (Original) An electrical component as claimed in claim 42, wherein said slots are approximately 150 μm length at 1.5 mm intervals.

44. (Currently Amended) A method of manufacturing an electrical component, comprising the steps of:

bonding a thin metal foil to an insulating substrate and thereby forming a component blank having a metal face that comprises a surface of said thin metal foil; and

laser machining at least the thin metal foil of said component blank to produce at least one trench for defining one or more foil tracks, without fully penetrating the insulating substrate, said trench being at least equal in depth to the thickness of the thin metal foil so as to prevent current flow across the trench.

45. (Currently Amended) An electrical component, comprising:

an insulating substrate;

a thin metal foil bonded to said insulating substrate;

a metal face comprising a surface of said thin metal foil; and

at least one laser machined trench defining one or more foil tracks and for preventing current flow across the trench, said trench being at least equal in depth to the thickness of the thin metal foil without fully penetrating the insulating substrate.